查询NJW1142供应商



PRELIMINARY

# AUDIO PROCESSOR

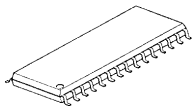
## ■ GENERAL DESCRIPTION

The **NJW1142** is a sound processor includes all of the functions required to process the audio signal for TV, such as tone control, balance, volume, mute, and AGC functions.

Also the **NJW1142** performs eala (NJRC Original Surround) which is regenerated 3D surround sound with only two speakers.

All of the internal status and variables are controlled by $I^2C$ BUS interface.

## ■ PACKAGE OUTLINE

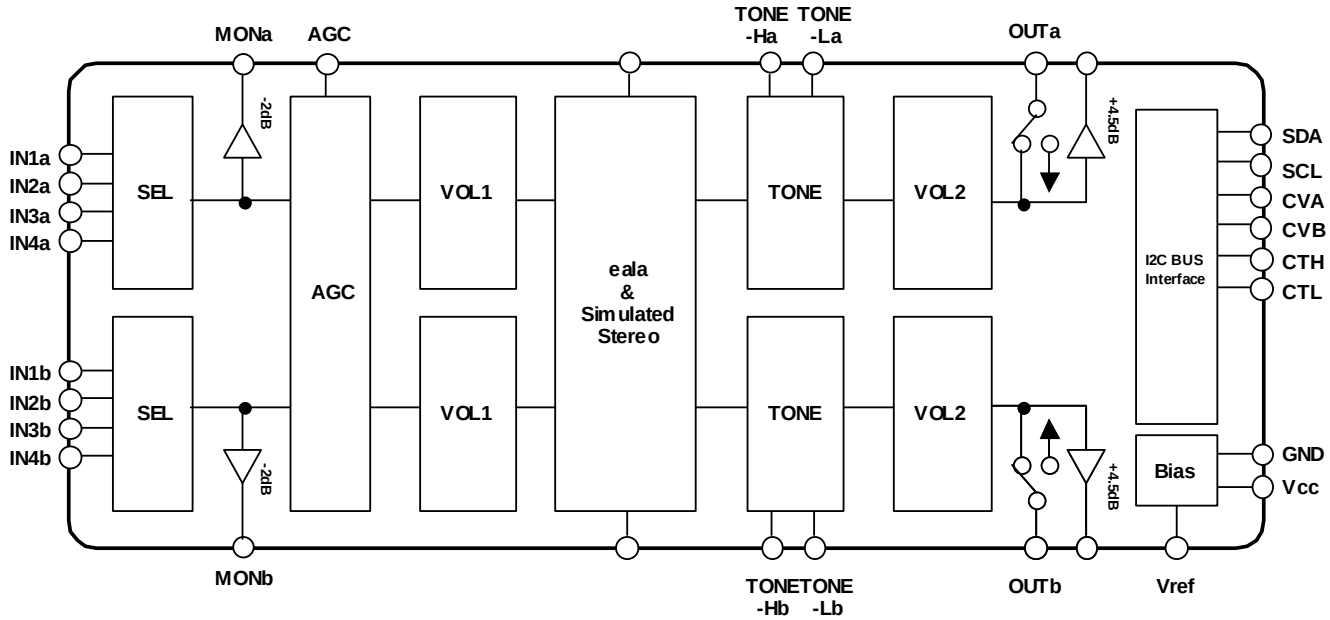


**NJW1142M**

## ■ FEATURES

- Operating Voltage 8 to 10V
- Internal 4 Input Audio Selectors and Monitor Output
- Low Noise VCA
- eala (NJRC Original Surround System)
- Simulated Stereo
- Variable AGC Compression Level via $I^2C$ (4-levels)
- Bi-CMOS Technology
- Package Outline SDMP30

## ■BLOCK DIAGRAM



■ **PIN CONFIGURATION**

| No. | Symbol | Function | | Symbol | Function |
|---|---|---|---|---|---|
| 1 | IN1a | Ach Input1 | 16 | V+ | Power Supply Pin |
| 2 | IN2a | Ach Input2 | 17 | Vref | Reference Voltage |
| 3 | IN3a | Ach Input3 | 18 | CTL | DAC Output for Tone Low Frequency |
| 4 | IN4a | Ach Input4 | 19 | CTH | DAC Output for Tone High Frequency |
| 5 | MONa | Ach Monitor Output | 20 | AGC | AGC Filter |
| 6 | SS FIL | Surround Filter | 21 | OUTb | Bch Output |
| 7 | TONE-Ha | Ach Treble Filter | 22 | LINEb | Bch LINE Output(+4.5dB) |
| 8 | TONE-La | Ach Bass Filter | 23 | TONE-Lb | Bch Bass Filter |
| 9 | LINEa | Ach LINE Output(+4.5dB) | 24 | TONE-Hb | Bch Treble Filter |
| 10 | OUTa | Ach Output | 25 | SR FIL | Surround Filter |
| 11 | CVA | DAC Output for Ach Volume & Balance | 26 | MONb | Bch Monitor Output |
| 12 | CVB | DAC Output for Bch Volume & Balance | 27 | IN4b | Bch Input4 |
| 13 | SDA | SDA Data Input ($I^2C$ BUS) | 28 | IN3b | Bch Input3 |
| 14 | SCL | SCL Data Input ($I^2C$ BUS) | 29 | IN2b | Bch Input2 |
| 15 | GND | GND | 30 | IN1b | Bch Input1 |

■ **ABSOLUTE MAXIMUM RATING** (Ta=25°C)

| PARAMETER | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage | $V^+$ | 12 | V |
| Power Dissipation | $P_D$ | 700 | mW |
| Operating Temperature Range | Topr | -20 to +75 | °C |
| Storage Temperature Range | Tstg | -40 to +125 | °C |

■ **ELECTRICAL CHARACTERISTICS** ( Ta=25°C, $V^+$=9V, Rg=600Ω, $R_L$=47kΩ, Vin=100mVrms/1kHz)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Operating Voltage | $V^+$ | | 8.0 | 9.0 | 10.0 | V |
| Supply Current | $I_{CC}$ | No Signal | - | 30 | 50 | mA |
| Reference Voltage | $V_{REF}$ | No Signal | 4.0 | 4.5 | 5.0 | V |
| Maximum Input Voltage | $V_{IM}$ | VOL=-20dB, THD=3% | 2.8 | 3.0 | - | Vrms |
| Maximum Output Voltage1 | $V_{OM1}$ | OUTPUT<br>VOL=0dB, THD=1% | - | 2.5 | - | Vrms |
| Maximum Output Voltage2 | $V_{OM2}$ | LINEOUT<br>VOL=0dB, THD=1% | - | 2.5 | - | Vrms |
| MON OUT Gain | $G_{VMON}$ | MON OUT | - | -2.0 | - | dB |
| LINEOUT Gain | $G_{VLINE}$ | LINEOUT, VOL=0dB | 2.5 | 4.5 | 6.5 | dB |
| Maximum Gain | $G_{VMAX}$ | VOL=0dB | -2.0 | 0.0 | 2.0 | dB |
| Minimum Gain | $G_{VMIN}$ | VOL=Mute, Vin=1Vrms<br>BW=400Hz to 30kHz | - | - | -70 | dB |
| Channel Balance | $G_{CB}$ | VOL=0dB | -1.5 | 0.0 | 1.5 | dB |
| Balance Boost A | $BA_{BST}$ | CHS="0",BAL="11111" | -2.0 | 0.0 | 2.0 | dB |
| Balance Cut A | $BA_{CUT}$ | CHS="1",BAL="11111"<br>Vin = 1Vrms | - | - | -70 | dB |
| Balance Boost B | $BB_{BST}$ | CHS="1",BAL="11111" | -2.0 | 0.0 | 2.0 | dB |
| Balance Cut B | $BB_{CUT}$ | CHS="0",BAL="11111"<br>Vin = 1Vrms | - | - | -70 | dB |
| Total Harmonic Distortion | THD | Vo=0.5Vrms<br>BW=400Hz to 30kHz | - | - | 0.5 | % |
| Input Selector Cross Talk | CT | Vin=1Vrms<br>BW=400Hz to 30kHz | - | - | -70 | dB |
| Channel Separation | CS | Vin=1Vrms<br>BW=400Hz to 30kHz | - | - | -70 | dB |
| Output Noise 1 | $V_{NO1}$ | VOL=0dB<br>BW=400Hz to 30kHz | -<br>- | -90<br>(31.6) | -85<br>(56.2) | dBV<br>(μVrms) |
| Output Noise 2 | $V_{NO2}$ | VOL=Mute<br>BW=400Hz to 30kHz | -<br>- | -106<br>(5.0) | -96<br>(15.8) | dBV<br>(μVrms) |
| Output Noise 3 | $V_{NO3}$ | LINEOUT, VOL=0dB<br>BW=400Hz to 30kHz | -<br>- | -85<br>(56.2) | -80<br>(100) | dBV<br>(μVrms) |
| Output Noise 4 | $V_{NO4}$ | LINEOUT, VOL=Mute<br>BW=400Hz to 30kHz | -<br>- | -101<br>(8.9) | -91<br>(28.2) | dBV<br>(μVrms) |

■ **ELECTRICAL CHARACTERISTICS** ( Ta=25°C, $V^+$=9V, Rg=600Ω, $R_L$=47kΩ, Vin=100mVrms/1kHz)

● **TONE CONTROL** (Tone Control-ON)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| High Frequency Boost | $HF_{BST}$ | TREBLE=+15dB, f=10kHz | 12.5 | 15.0 | 17.5 | dB |
| High Frequency Flat | $HF_{FLT}$ | TRBE=0dB, f=10kHz | -2.0 | 0.0 | 2.0 | dB |
| High Frequency Cut | $HF_{CUT}$ | TREBLE=-15dB, f=10kHz | -17.5 | -15.0 | -12.5 | dB |
| Low Frequency Boost | $LF_{BST}$ | BASS=+15dB, f=100Hz | 12.5 | 15.0 | 17.5 | dB |
| Low Frequency Flat | $LF_{FLT}$ | BASS=0dB, f=100Hz | -2.0 | 0.0 | 2.0 | dB |
| Low Frequency Cut | $LF_{CUT}$ | BASS=-15dB, f=100Hz | -17.5 | -15.0 | -12.5 | dB |

● **SUB-TONE CONTROL** (Sub-Tone Control-ON)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| High Frequency Boost | $SHF_{BST}$ | SUB-TREBLE=+3dB, f=10kHz | 2.0 | 3.0 | 4.0 | dB |
| High Frequency Flat | $SHF_{FLT}$ | SUB-TREBLE=0dB, f=10kHz | -2.0 | 0.0 | 2.0 | dB |
| High Frequency Cut | $SHF_{CUT}$ | SUB-TREBLE=-3dB, f=10kHz | -4.0 | -3.0 | -2.0 | dB |
| Low Frequency Boost | $SLF_{BST}$ | SUB-BASS=+3dB, f=100Hz | 2.0 | 3.0 | 4.0 | dB |
| Low Frequency Flat | $SLF_{FLT}$ | SUB-BASS=0dB, f=100Hz | -2.0 | 0.0 | 2.0 | dB |
| Low Frequency Cut | $SLF_{CUT}$ | SUB-BASS=-3dB, f=100Hz | -4.0 | -3.0 | -2.0 | dB |

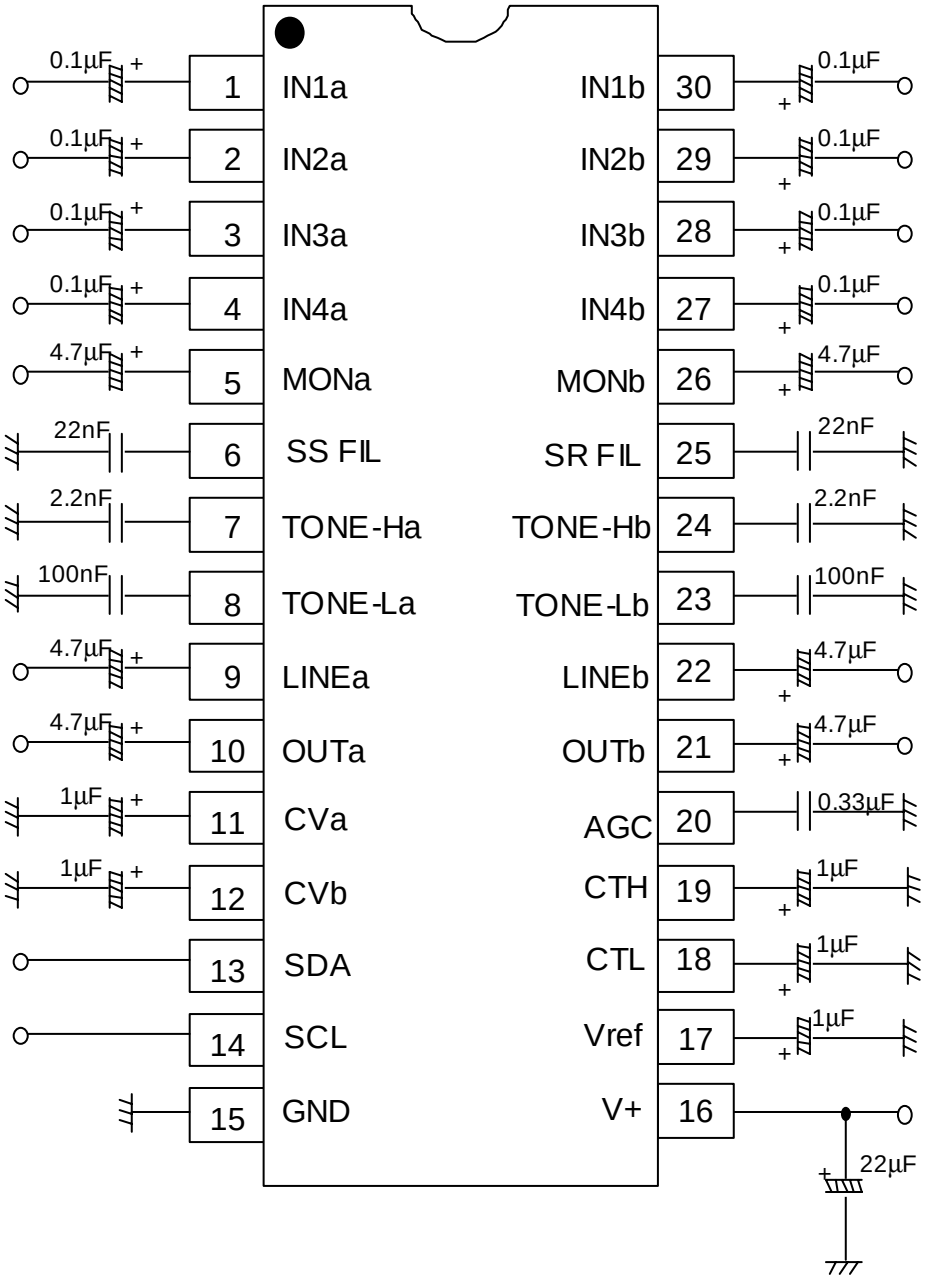
● **AGC** (AGC-ON)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| AGC BOOST | $AGC_{BST}$ | Vin=50mVrms | 1.5 | 3.5 | 5.5 | dB |
| AGC FLAT 1 | $AGC_{FLT1}$ | Vin=300mVrms | -2.5 | 0.0 | 2.5 | dB |
| AGC FLAT 2 | $AGC_{FLT2}$ | Vin=400mVrms | -2.5 | 0.0 | 2.5 | dB |
| AGC FLAT 3 | $AGC_{FLT3}$ | Vin=500mVrms | -2.5 | 0.0 | 2.5 | dB |
| AGC FLAT 4 | $AGC_{FLT4}$ | Vin=600mVrms | -2.5 | 0.0 | 2.5 | dB |
| AGC CUT | $AGC_{CUT}$ | Vin=2Vrms | -14 | -10 | -6.0 | dB |

●**SURROUND** (SURROUND-ON)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Simulated Stereo A | $SR_{SIMA}$ | Ain+Bin → Aout, f=1kHz | 1.0 | 3.0 | 5.0 | dB |
| Simulated Stereo B | $SR_{SIMB}$ | Ain+Bin → Bout, f=1kHz | 1.0 | 3.0 | 5.0 | dB |
| Surround 3D1 | $SR_{3D1}$ | Ain → Aout, f=100Hz | 8.0 | 10.0 | 12.0 | dB |
| Surround 3D2 | $SR_{3D2}$ | Ain → Aout, f=10kHz | -2.0 | 0.0 | 2.0 | dB |
| Surround 3D3 | $SR_{3D3}$ | Ain → Bout, f=100Hz | 4.5 | 6.5 | 8.5 | dB |

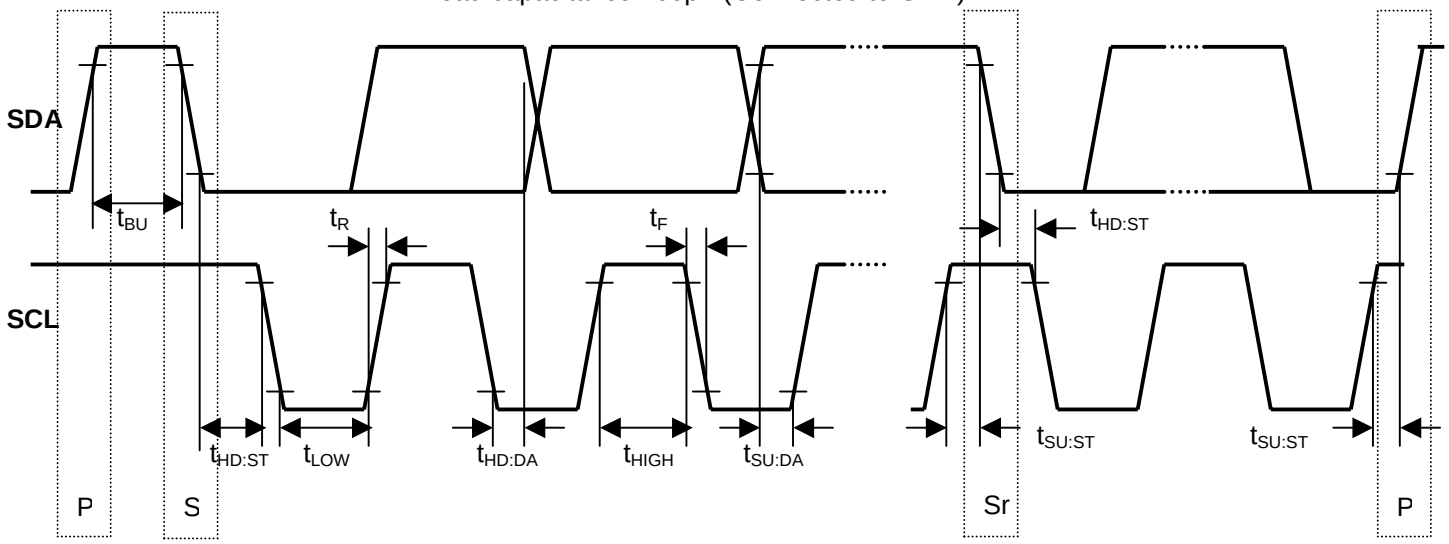
■ **APPLICATION CIRCUIT**



■ **I²C BUS BLOCK CHARACTERISTICS (SDA,SCL)**

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| High Level Input Voltage | $V_{IH}$ | 3.0 | - | 5.0 | V |
| Low Level Input Voltage | $V_{IL}$ | 0 | - | 1.5 | V |
| High Level Input Current | $I_{IH}$ | - | - | 10 | μA |
| Low Level Input Current | $I_{IL}$ | - | - | 10 | μA |
| Low Level Output Voltage (3mA at SDA pin) | $V_{OL}$ | 0 | - | 0.4 | V |
| Maximum Output Current | $I_{OL}$ | -3.0 | - | - | mA |
| Maximum Clock Frequency | $f_{SCL}$ | 0 | - | 100 | kHz |
| Data Change Minimum Waiting Time | $t_{BUF}$ | 4.7 | - | - | μs |
| Data Transfer Start Minimum Waiting Time | $t_{HD:STA}$ | 4.0 | - | - | μs |
| Low Level Clock Pulse Width | $t_{LOW}$ | 4.7 | - | - | μs |
| High Level Clock Pulse Width | $T_{HIGH}$ | 4.0 | - | - | μs |
| Minimum Start Preparation Waiting Time | $t_{SU:STA}$ | 4.7 | - | - | μs |
| Minimum Data Hold Time | $t_{HD:DAT}$ | 5.0 | - | - | μs |
| Minimum Data Preparation Time | $t_{SU:DAT}$ | 250 | - | - | ns |
| Rise Time | $t_R$ | - | - | 1.0 | μs |
| Fall Time | $t_F$ | - | - | 300 | ns |
| Minimum Stop Preparation Waiting Time | $t_{SU:STO}$ | 4.7 | - | - | μs |

I²C BUS Load Condition: Pull up resistance 4kΩ (Connected to +5V)
Load capacitance 200pF (Connected to GND)



## ■ DEFINITION OF I²C REGISTER

### ♦ I²C BUS FORMAT

| | MSB LSB | | MSB LSB | | MSB LSB | | |
|---|---|---|---|---|---|---|---|
| S | Slave Address | A | Select Address | A | Data | A | P |
| 1bit | 8bit | 1bit | 8bit | 1bit | 8bit | 1bit | 1bit |

S: Starting Term
A: Acknowledge Bit
P: Ending Term

### ♦ SLAVE ADDRESS

| MSB | | | | | | | LSB |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | R/$\overline{W}$ |

R/$\overline{W}$=0: Receive Only
R/$\overline{W}$=1: No Output Data

### ♦ CONTROL REGISTER TABLE

The select address sets each function (Volume, Balance, AGC, Surround, Tone Control, AUX).
The auto increment function cycles the select address as follows.
00H→01H→02H→03H→04H→05H→00H

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 00H | VOL | | | | | | | |
| 01H | CHS | BAL | | | | | SUR1 | SUR0 |
| 02H | BCB | BASS | | | | BCSB | SUB-BASS | |
| 03H | BCT | TREB | | | | BCST | SUB-TREB | |
| 04H | Don't Care | | | | | | | |
| 05H | OUT | SEL | | | AGC1 | AGC0 | AGC | Don't Care |

### ♦ CONTROL REGISTER DEFAULT VALUE

Control register default value is all "0".

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 00H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

■INSTRUCTION CODE

a) MASTER VOLUME SETTING

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 00H | VOL | | | | | | | |

The volume control for both Ach and Bch(0.33dB/step).
The volume is consisted of volume1 and volume2 and the level is divided into half to each volume1 and volume2.

b) BALANCE, AGC AND SURROUND SETTING

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 01H | CHS | BAL | | | | | SR1 | SR0 |

- CHS : Channel select for balance control
  "0" : Ach "Bch is attenuated"
  "1" : Bch "Ach is attenuated"
- BAL : Balance control for both Ach and Bch(1dB/Step)
  The balance is consisted of volume1 and volume2 and the level is divided into half to each volume1 and volume2.
- "SR1", "SR0" : Surround Mode select

| Surround Mode | SR1 (D1) | SR0 (D0) |
|---|---|---|
| Surround Off(Bypass) | 0 | 0 |
| Simulated Stereo | 0 | 1 |
| eala effect large | 1 | 0 |
| eala effect small | 1 | 1 |

c)TONE CONTROL BASS SETTING

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 02H | BCB | BASS | | | | BCSB | SUB-BASS | |

- BCB : Boost cut select for Bass control
  "0" : Cut
  "1" : Boost
- BASS: BASS control
  Cut Level : -15dB to 0dB(1dB/Step)
  Boost Level : 0dB to +15dB(1dB/Step)
- BCSB : Boost cut select for SUB-BASS control
  "0" : Cut
  "1" : Boost
- SUB-BASS: SUB- BASS control(1dB/Step)
  Sub-Cut Level : -3dB to 0dB(1dB/Step)
  Sub-Boost Level : 0dB to +3dB(1dB/Step)

**d) TONE CONTROL TREBLE SETTING**

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 03H | BCT | TREB | | | | BCST | SUB-TREB | |

- BCT : Boost cut select for Treble control
  - "0" : Cut
  - "1" : Boost
- TREB: Treble control(1dB/step)
  - Cut Level : -15dB to 0dB(1dB/Step)
  - Boost Level : 0dB to +15dB(1dB/Step)
- BCST : Boost cut select for Sub-Treble control
  - "0" : Cut
  - "1" : Boost
- SUB-TREB: Sub-Treble control(1dB/step)
  - Sub-Cut Level : -3dB to 0dB(1dB/Step)
  - Sub-Boost Level : 0dB to +3dB(1dB/Step)

**e)OUTPUT AND AUXILIARY SETTING**

| Select Address | BIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 05H | OUT | SEL | | | AGC1 | AGC0 | AGC | Don't Care |

- OUT: ON/OFF Switch for OUTPUT
  - "0" : OFF(MUTE)
  - "1" : ON

- SEL: Input Selector

| Input Channel Selector | SEL | | |
|---|---|---|---|
| | D6 | D5 | D4 |
| 1 | 0 | 1 | 0 |
| 2 | 0 | 1 | 1 |
| 3 | 1 | 0 | 0 |
| 4 | 1 | 0 | 1 |

- AGC1: AGC Level Setting

| AGC Level | AGC1(D3) | AGC0(D2) | AGC (D1) |
|---|---|---|---|
| 300mVrms | 0 | 0 | 1 |
| 400mVrms | 0 | 1 | 1 |
| 500mVrms | 1 | 0 | 1 |
| 600mVrms | 1 | 1 | 1 |
| AGC Off | ✳ | ✳ | 0 |

✳ Don't Care

■MASTER VOLUME (Select Address : 00H)

| | | VOL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Gain(dB) | HEX | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| 0 | FF | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| -1 | FC | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| -2 | F9 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| -3 | F6 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| -4 | F3 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| -5 | F0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| -6 | ED | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| -7 | EA | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| -8 | E7 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| -9 | E4 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| -10 | E1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| -11 | DE | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| -12 | DB | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| -13 | D8 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| -14 | D5 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| -15 | D2 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| -16 | CF | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| -17 | CC | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| -18 | C9 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| -19 | C6 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| -20 | C3 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| -21 | C0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| -22 | BD | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| -23 | BA | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| -24 | B7 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| -25 | B4 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| -26 | B1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| -27 | AE | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| -28 | AB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| -29 | A8 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| -30 | A5 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| -31 | A2 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| -32 | 9F | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| -33 | 9C | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| -34 | 99 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| -35 | 96 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| -36 | 93 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| -37 | 90 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| -38 | 8D | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| -39 | 8A | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| -40 | 87 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| -41 | 84 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| -42 | 81 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

■MASTER VOLUME (Select Address : 00H)

| | | VOL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Gain(dB) | HEX | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| -43 | 7E | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| -44 | 7B | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| -45 | 78 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| -46 | 75 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| -47 | 72 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| -48 | 6F | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| -49 | 6C | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| -50 | 69 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| -51 | 66 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| -52 | 63 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| -53 | 60 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| -54 | 5D | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| -55 | 5A | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| -56 | 57 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| -57 | 54 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| -58 | 51 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| -59 | 4E | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| -60 | 4B | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| -61 | 48 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| -62 | 45 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| -63 | 42 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| -64 | 3F | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| -65 | 3C | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| -66 | 39 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| -67 | 36 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| -68 | 33 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| -69 | 30 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| -70 | 2D | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| -71 | 2A | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| -72 | 27 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| -73 | 24 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| -74 | 21 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| -75 | 1E | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| -76 | 1B | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| -77 | 18 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| -78 | 15 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| -79 | 12 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| -80 | 0F | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| -81 | 0C | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| -82 | 09 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| -83 | 06 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| -84 | 03 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Mute | 00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

■**BALANCE(Select Address : 01H)**

| Channel Select (CHS) | D7 |
|---|---|
| Ach(Bch is attenuated) | 0 |
| Bch(Ach is attenuated) | 1 |

| | BAL | | | | |
|---|---|---|---|---|---|
| Gain(dB) | D6 | D5 | D4 | D3 | D2 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| -1 | 0 | 0 | 0 | 0 | 1 |
| -2 | 0 | 0 | 0 | 1 | 0 |
| -3 | 0 | 0 | 0 | 1 | 1 |
| -4 | 0 | 0 | 1 | 0 | 0 |
| -5 | 0 | 0 | 1 | 0 | 1 |
| -6 | 0 | 0 | 1 | 1 | 0 |
| -7 | 0 | 0 | 1 | 1 | 1 |
| -8 | 0 | 1 | 0 | 0 | 0 |
| -9 | 0 | 1 | 0 | 0 | 1 |
| -10 | 0 | 1 | 0 | 1 | 0 |
| -11 | 0 | 1 | 0 | 1 | 1 |
| -12 | 0 | 1 | 1 | 0 | 0 |
| -13 | 0 | 1 | 1 | 0 | 1 |
| -14 | 0 | 1 | 1 | 1 | 0 |
| -15 | 0 | 1 | 1 | 1 | 1 |
| -16 | 1 | 0 | 0 | 0 | 0 |
| -17 | 1 | 0 | 0 | 0 | 1 |
| -18 | 1 | 0 | 0 | 1 | 0 |
| -19 | 1 | 0 | 0 | 1 | 1 |
| -20 | 1 | 0 | 1 | 0 | 0 |
| -21 | 1 | 0 | 1 | 0 | 1 |
| -22 | 1 | 0 | 1 | 1 | 0 |
| -23 | 1 | 0 | 1 | 1 | 1 |
| -24 | 1 | 1 | 0 | 0 | 0 |
| -25 | 1 | 1 | 0 | 0 | 1 |
| -26 | 1 | 1 | 0 | 1 | 0 |
| -27 | 1 | 1 | 0 | 1 | 1 |
| -28 | 1 | 1 | 1 | 0 | 0 |
| -29 | 1 | 1 | 1 | 0 | 1 |
| -30 | 1 | 1 | 1 | 1 | 0 |
| Mute | 1 | 1 | 1 | 1 | 1 |

■TONE CONTROL BASS (Select Address : 02H)

| Bass Cut or Boost | BCB D7 |
|---|---|
| Cut | 0 |
| Boost | 1 |

| | | BASS | | | |
|---|---|---|---|---|---|
| Cut Gain(dB) | Boost Gain(dB) | D6 | D5 | D4 | D3 |
| -15 | 15 | 1 | 1 | 1 | 1 |
| -14 | 14 | 1 | 1 | 1 | 0 |
| -13 | 13 | 1 | 1 | 0 | 1 |
| -12 | 12 | 1 | 1 | 0 | 0 |
| -11 | 11 | 1 | 0 | 1 | 1 |
| -10 | 10 | 1 | 0 | 1 | 0 |
| -9 | 9 | 1 | 0 | 0 | 1 |
| -8 | 8 | 1 | 0 | 0 | 0 |
| -7 | 7 | 0 | 1 | 1 | 1 |
| -6 | 6 | 0 | 1 | 1 | 0 |
| -5 | 5 | 0 | 1 | 0 | 1 |
| -4 | 4 | 0 | 1 | 0 | 0 |
| -3 | 3 | 0 | 0 | 1 | 1 |
| -2 | 2 | 0 | 0 | 1 | 0 |
| -1 | 1 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |

■TONE CONTROL SUB-BASS (Select Address : 02H)

| Sub-Bass Cut or Boost | BCSB D2 |
|---|---|
| Cut | 0 |
| Boost | 1 |

| | | SUB-BASS | |
|---|---|---|---|
| Cut Gain(dB) | Boost Gain(dB) | D1 | D0 |
| -3 | 3 | 1 | 1 |
| -2 | 2 | 1 | 0 |
| -1 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 |

■TONE CONTROL TREBLE (Select Address : 03H)

| Treble Cut or Boost | BCT D7 |
|---|---|
| Cut | 0 |
| Boost | 1 |

| | | TREB | | | |
|---|---|---|---|---|---|
| Cut Gain(dB) | Boost Gain(dB) | D6 | D5 | D4 | D3 |
| -15 | 15 | 1 | 1 | 1 | 1 |
| -14 | 14 | 1 | 1 | 1 | 0 |
| -13 | 13 | 1 | 1 | 0 | 1 |
| -12 | 12 | 1 | 1 | 0 | 0 |
| -11 | 11 | 1 | 0 | 1 | 1 |
| -10 | 10 | 1 | 0 | 1 | 0 |
| -9 | 9 | 1 | 0 | 0 | 1 |
| -8 | 8 | 1 | 0 | 0 | 0 |
| -7 | 7 | 0 | 1 | 1 | 1 |
| -6 | 6 | 0 | 1 | 1 | 0 |
| -5 | 5 | 0 | 1 | 0 | 1 |
| -4 | 4 | 0 | 1 | 0 | 0 |
| -3 | 3 | 0 | 0 | 1 | 1 |
| -2 | 2 | 0 | 0 | 1 | 0 |
| -1 | 1 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 |

■TONE CONTROL SUB-TREBLE (Select Address : 03H)

| Sub-Treble Cut or Boost | BCST D2 |
|---|---|
| Cut | 0 |
| Boost | 1 |

| | | SUB-TREB | |
|---|---|---|---|
| Cut Gain(dB) | Boost Gain(dB) | D1 | D1 |
| -3 | 3 | 1 | 1 |
| -2 | 2 | 1 | 0 |
| -1 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 |

■NOTE

Purchase of $I^2C$ components of New Japan Radio Co., Ltd or one of its sublicensed Associated Companies conveys a license under the Philips $I^2C$ Patent Rights to use these components in an $I^2C$ system, provided that the system conforms to the $I^2C$ Standard Specification as defined by

[CAUTION]
The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.

WWW.ALLDATASHEET.COM

Copyright © Each Manufacturing Company.

All Datasheets cannot be modified without permission.

This datasheet has been download from :

www.AllDataSheet.com

100% Free DataSheet Search Site.

Free Download.

No Register.

Fast Search System.

www.AllDataSheet.com